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S. Malkin's algorithm of inventive problem solving as an instrument to mastering technical systems in supplementary mathematical education of school students

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Abstract

© 2015 by iSER, International Society of Educational Research. The relevance of the research is determined by the complexity that secondary school students experience when they master the regularities of development and existence of technical systems as an important link in the creation of the structured knowledge system, abilities and the correct world perception, and training to search task solutions arising in technical systems. In this regard, the goal of the conducted research is to create approaches in teaching practices that will provide learner involvement in technical systems research and, consequently, will promote conditions for the solution of mathematical inventive problems. The main approach to the training of vocational technical creativity is G.S. Altshuller's (1956) theory of inventive problem solving (TRIZ) that takes a specific place in Russia. Labor-intensiveness and complexity of application of TRIZ in the educational process determined the creation of simplified algorithms of inventive problem solving. . Malkin's (2012) algorithm of inventive problem solving "Generator of ideas" was selected, which is based on a part of algorithms of inventive problem solving (ARIZ). The pilot study conducted since 2010 has helped to develop an approach to the organization of learners' activities when working with the algorithm of inventive problem solving. Due to the approach that school students have formulated and solved tasks arising in technical systems, some solutions have been patented and certified by the Federal Service for Intellectual Property. The materials of this paper may be useful for teachers of general and supplementary mathematical education of school students, who are engaged in technical creativity, and for all those who study new opportunities of creative search in the sphere of mathematical apparatus of technical systems.

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Keywords

Algorithm of inventive problem solving, Algorithms of new ideas designing, Creative pedagogics, Open type tasks, Supplementary mathematical education of school students, Technical systems